Spatialisation des disponibilités et géostratégie de l'utilisation des aliments des animaux dans le monde

A.Ickowicz, D. Bastianelli & P. Lecomte,

UMR SELMET (CIRAD INRA SupAgro)

La journée de printemps de
l'Association Française de Zootechnie
FEEDIPEDIA
Première encyclopédie évolutive en ligne sur les aliments des animaux d'élevage du monde entier

30 janvier 2013, AgroParisTech, PARIS

Le poids de l'élevage dans l'écosystème global

Ressources

- Le secteur élevage utilise > **3.9 10 ^{9}** ha (30% surf. terrestre).
- **1,4. 10 ^{9}** ha : prairies améliorées et **2. 10 ^{9}** ha pâturages naturels extensif
- **500** millions d'hectares cultures vocation aliments et fourrages (35% terres cultivables),

Animaux

- Veaux, vaches, cochons, couvées… en 2010 : **23 .10 ^{9}** têtes *vs* **6. 10^{9}** en 1960 (Faostat)
- Croissance monogastriques forte: volailles **x 5**, porcs **x 2.4** , bovins **x 1.5**

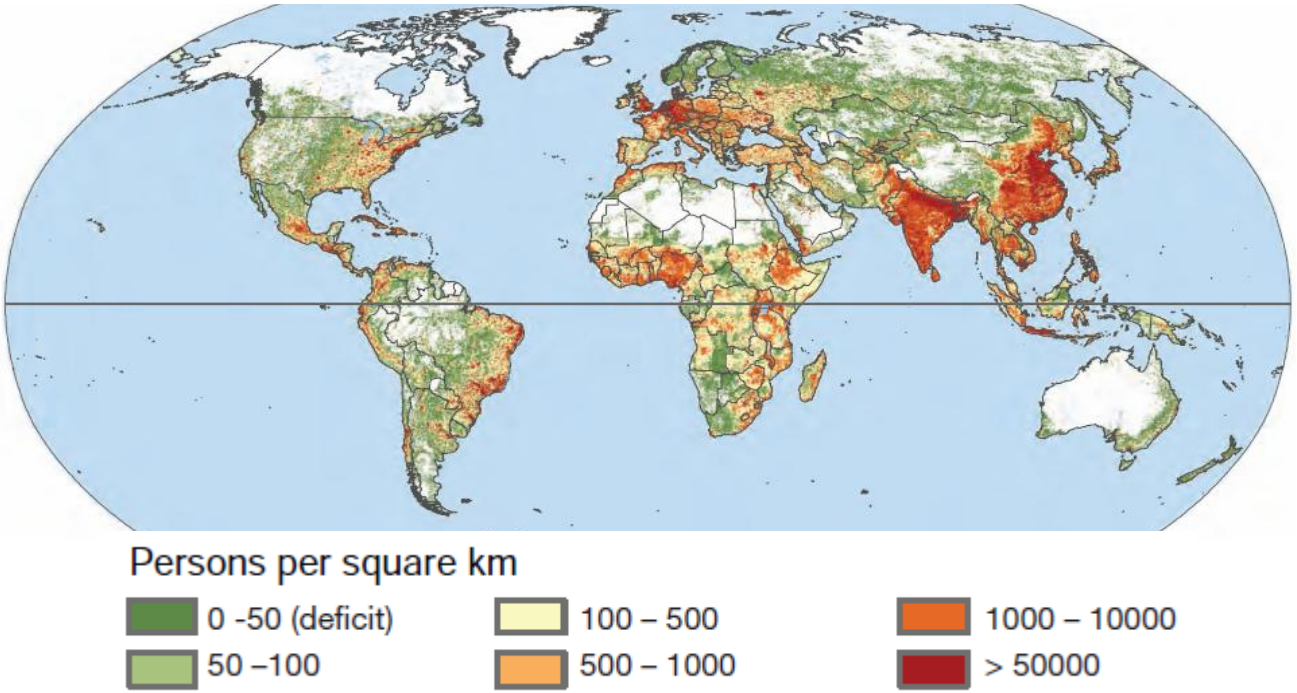
Produits

- Demande croissante : démographie, urbanisation, revenus en pays émergeants

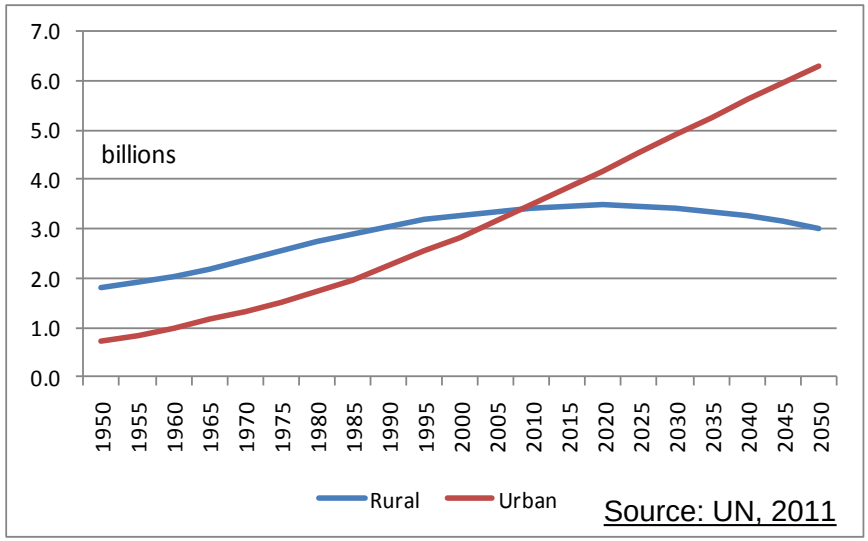
Tendances / espaces

- relocalisation ressources animaux, intensification, Intégration, financiarisation concentrations importance du transport et flux

Une population qui croît et s'urbanise

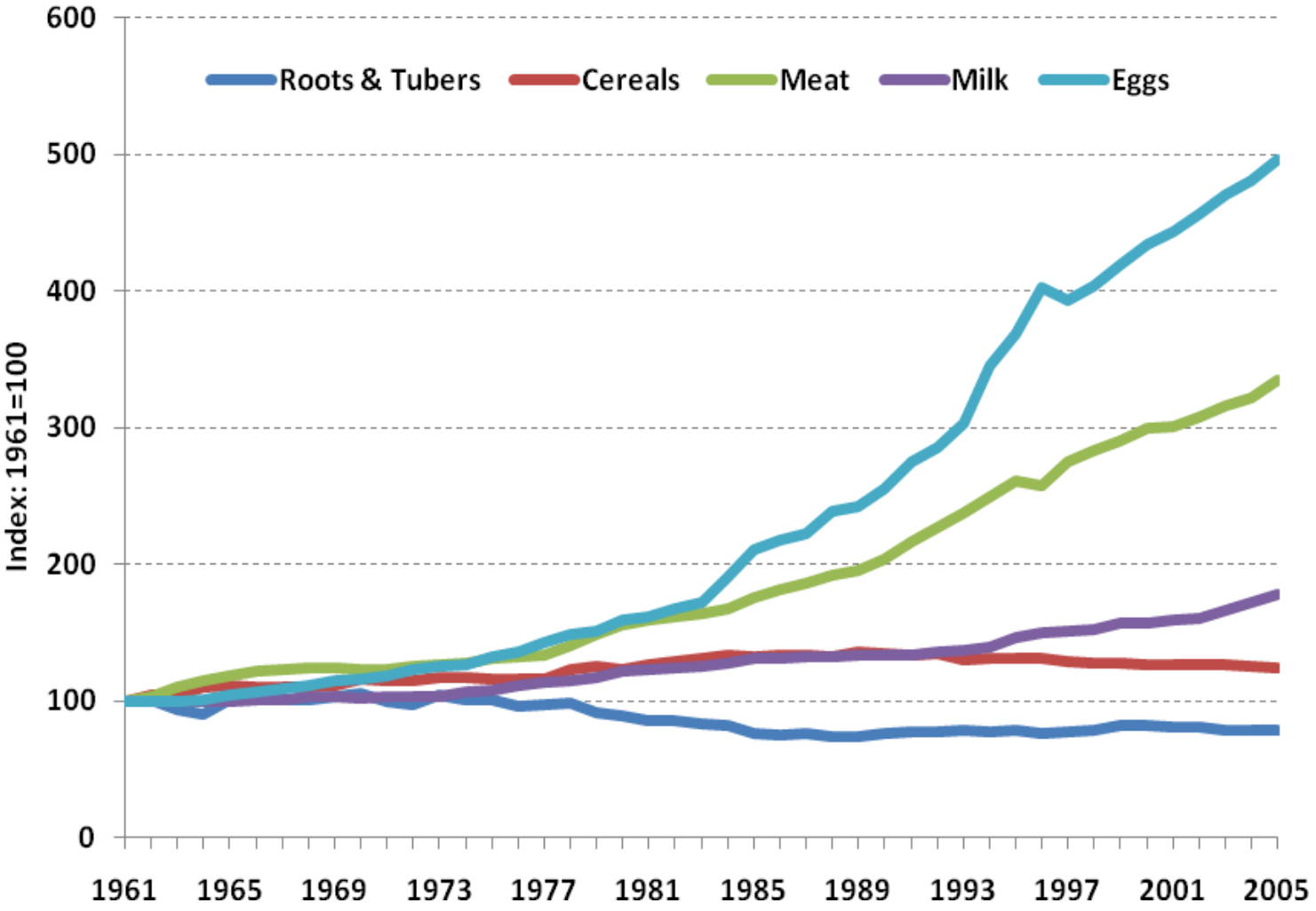


FAO, 2006



Source: UN, 2011

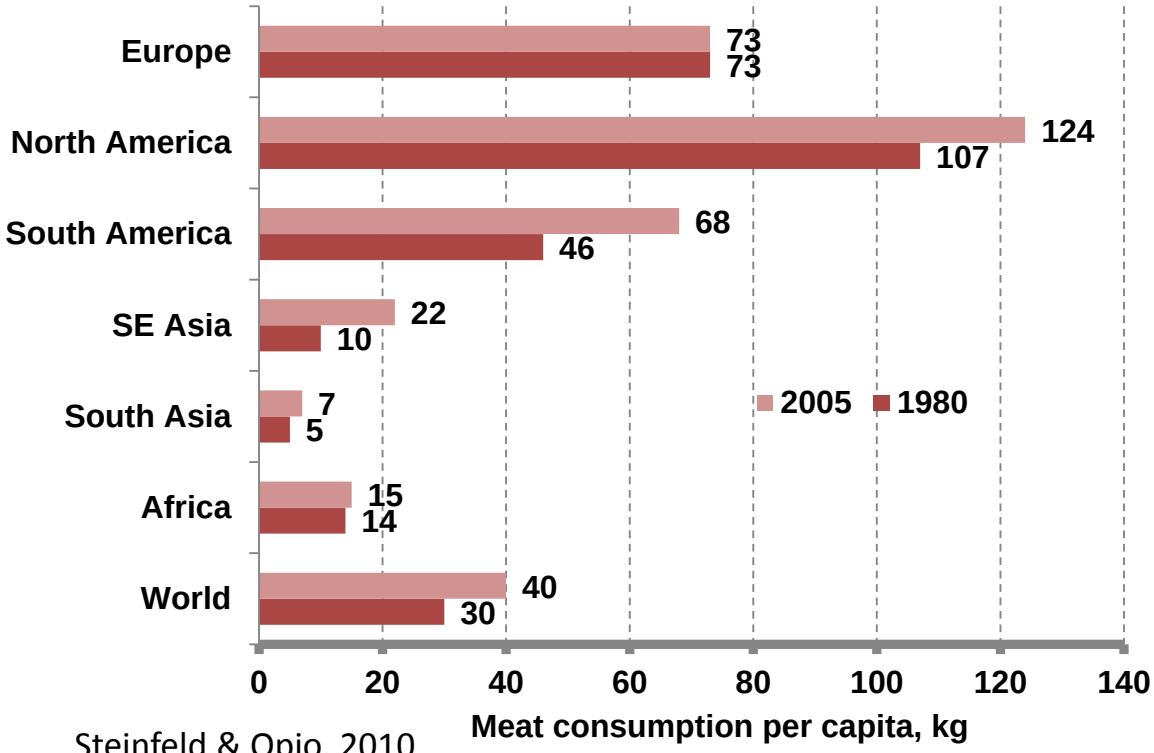
Des profils de consommation qui évoluent



Steinfeld & Opio, 2010

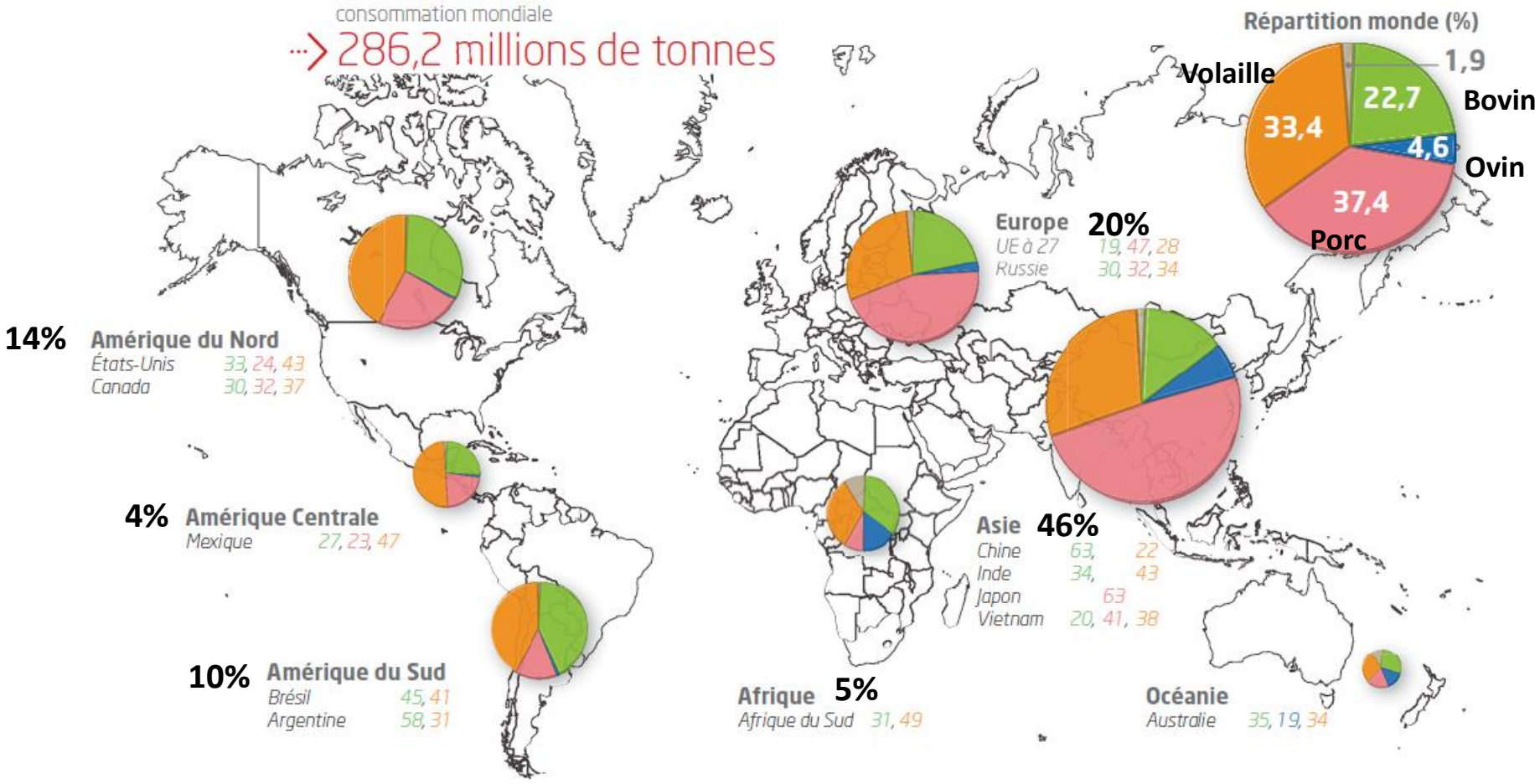
Inégalités spatiales

	1980	2006/08 (forecast)	2015
Per caput consumption, Developing	14 kg	29 kg	33 kg
Per caput consumption, Developed	77 kg	80 kg	85 kg



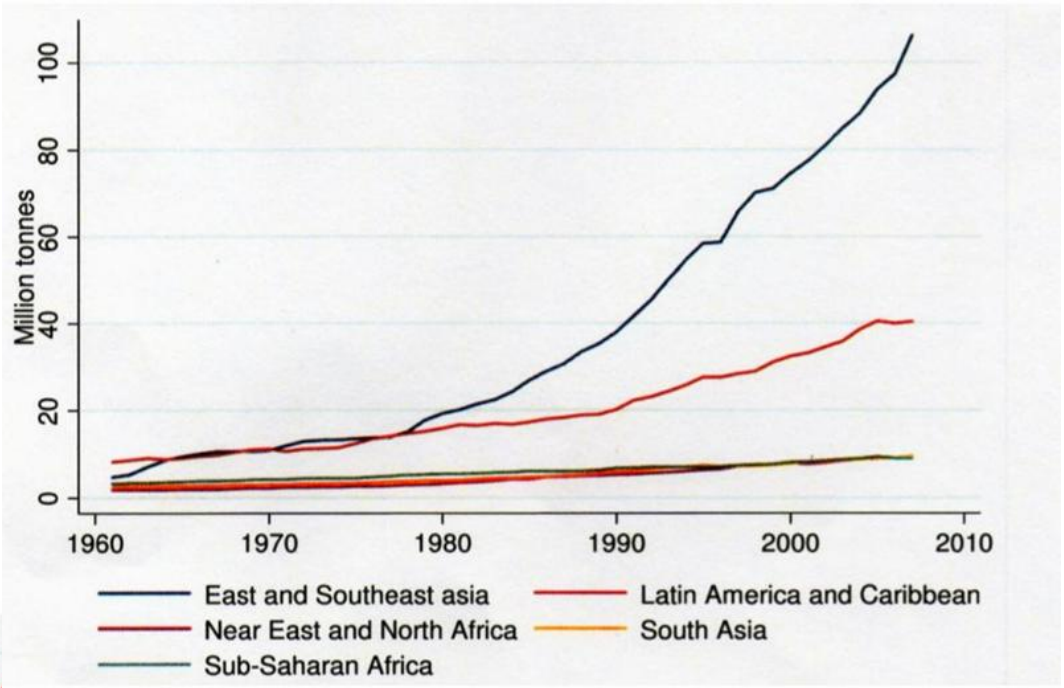
Steinfeld & Opio, 2010

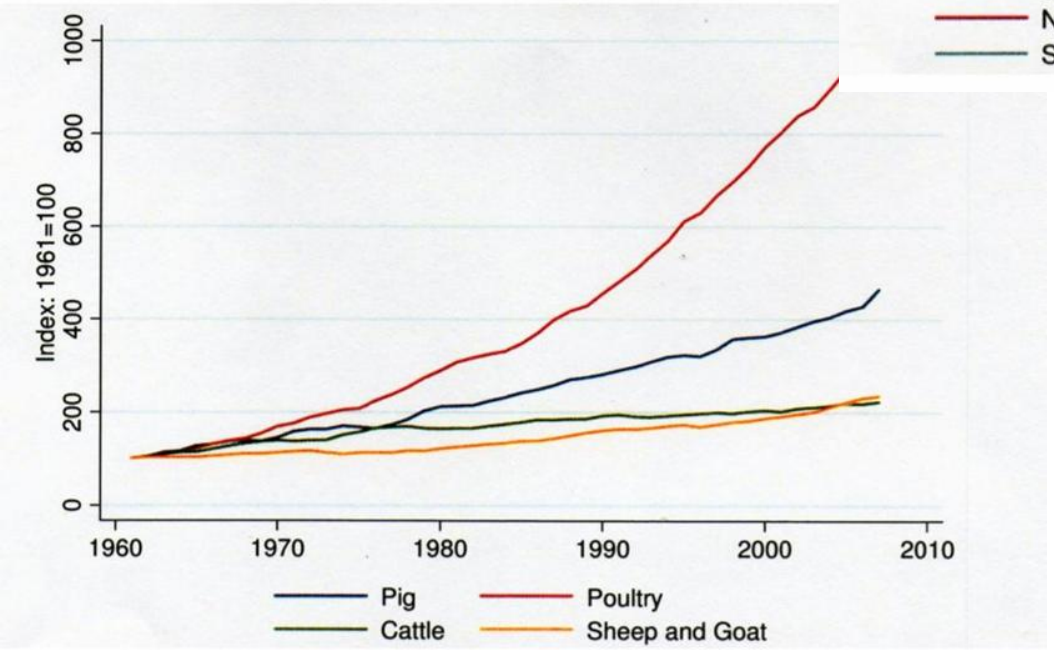
Consommation de produits carnés à travers le monde



Source : FranceAgriMer d'après FAO (estimation 2010)

Les nouveaux grands acteurs de la production





Quels systèmes, quelles ressources

Diversité des systèmes et usages des ressources naturelles

Grazed Ecosystems

Dry

Humid

Nomadic S.

Forage trees

Annuals

Perenials

Fencing S.

Cultivated Ecosystems

Crops & residues

Improved grasslands

Crop Livestock S.

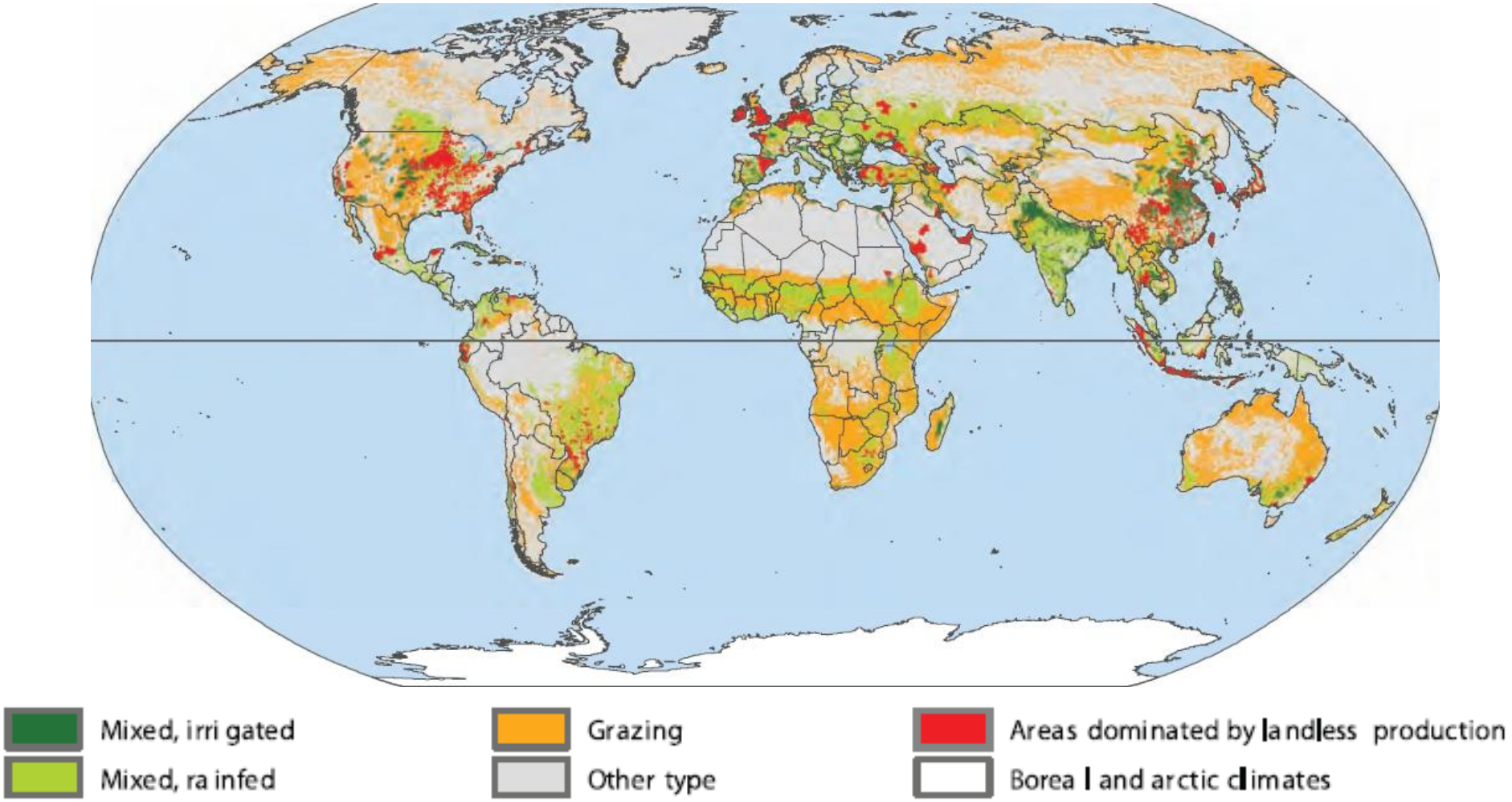
Agroindustrial by products

Peri UrbanS.
Industrials S.

« *Low input* » → « *High imput* »

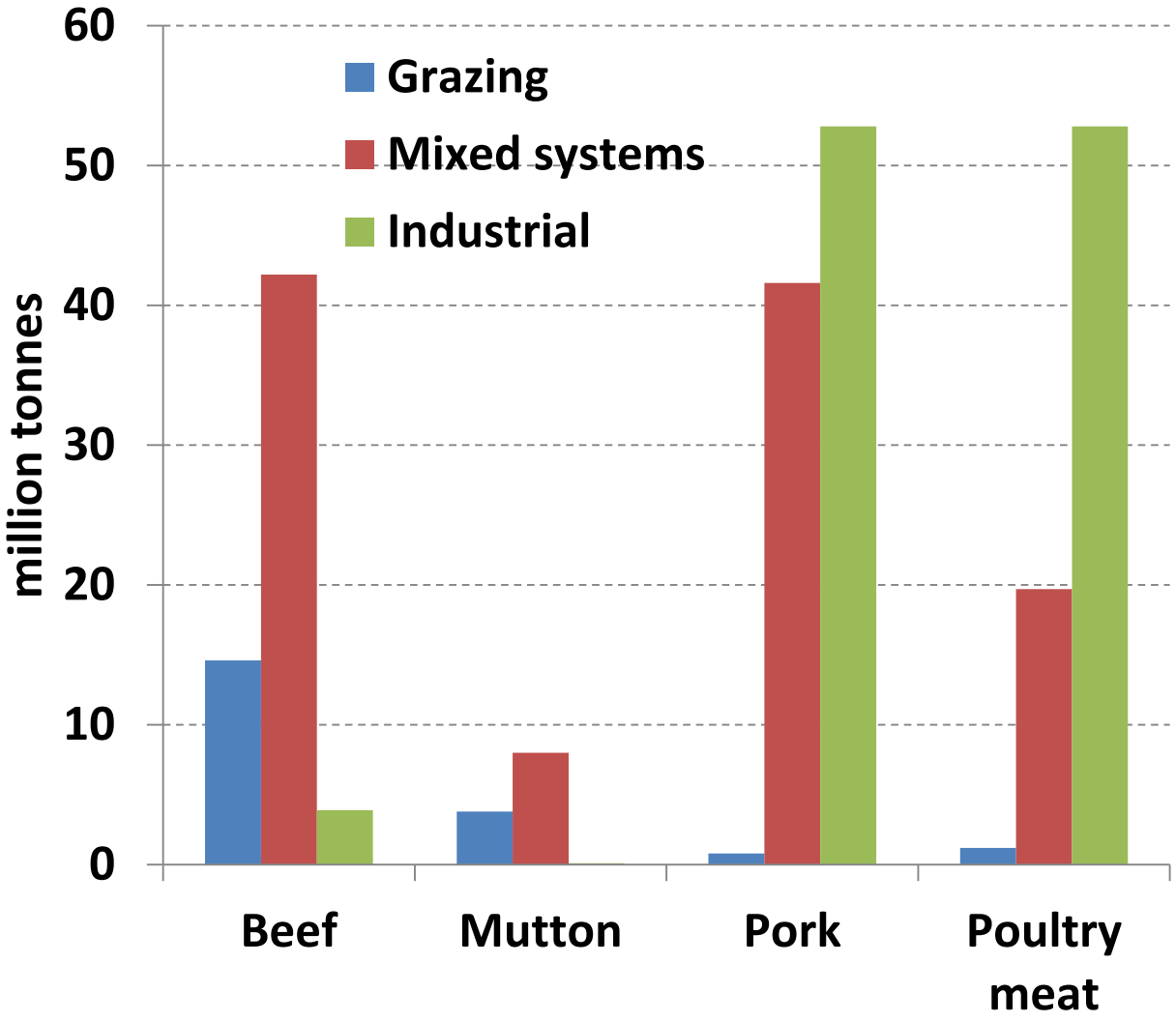
Population	*Low*	*Dense*
Agriculture	*Shifting*	*Intensified*
Vegetation	*1 month*	*8 à 12 months*
Climate/soils	*Dry/poor*	*Humid /rich*
Chains	*Some OP*	*Interprofession*
Societies	*Traditional*	*Modern*

Géographie des systèmes de production animale



FAO, 2006

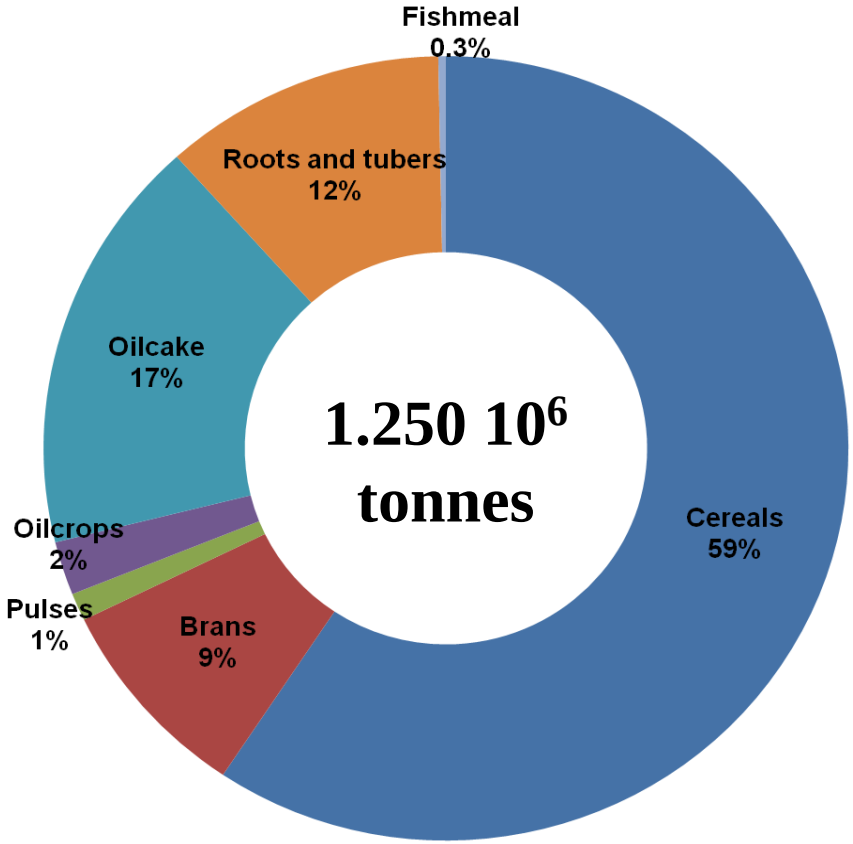
Contributions systèmes à la production de viande



Steinfeld & Opio, 2010

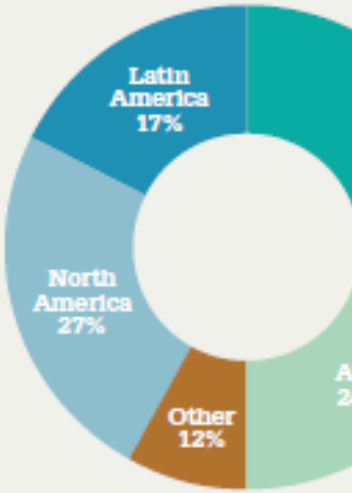
Consommations globales

Aliments bétail et aquaculture, 2005



Steinfeld & Opio, 2010

WORLDWIDE COMPOUND FEED PRODUCTION 2010



Top Ten	tonnes in millions
USA	160
EU 27	150
China	160
Brazil	60
Mexico	28
Canada	25
Japan	24
Russia	18
Korea	16
India	15
Total	**720**

International Feed Industry Federation Annual Report 2011

Des ressources et des produits

Viandes/Fourrages et aliments Millions tonnes	Ruminants		Nonruminants			
	Beef	Sheep and goat	Pork	Poultry	Total	
Production (carcass weight)	61	12	95	75	243	
Production, industrialized (%)	7	1	57	72	0.45	
						%
Estimated concentrate feed inputs						
Cereals	87	7	221	121	436	21
Oilseed meals	36	2	91	50	179	8
Roots and tubers	—	—	85	14	99	5
Subtotal	123	9	397	185	714	

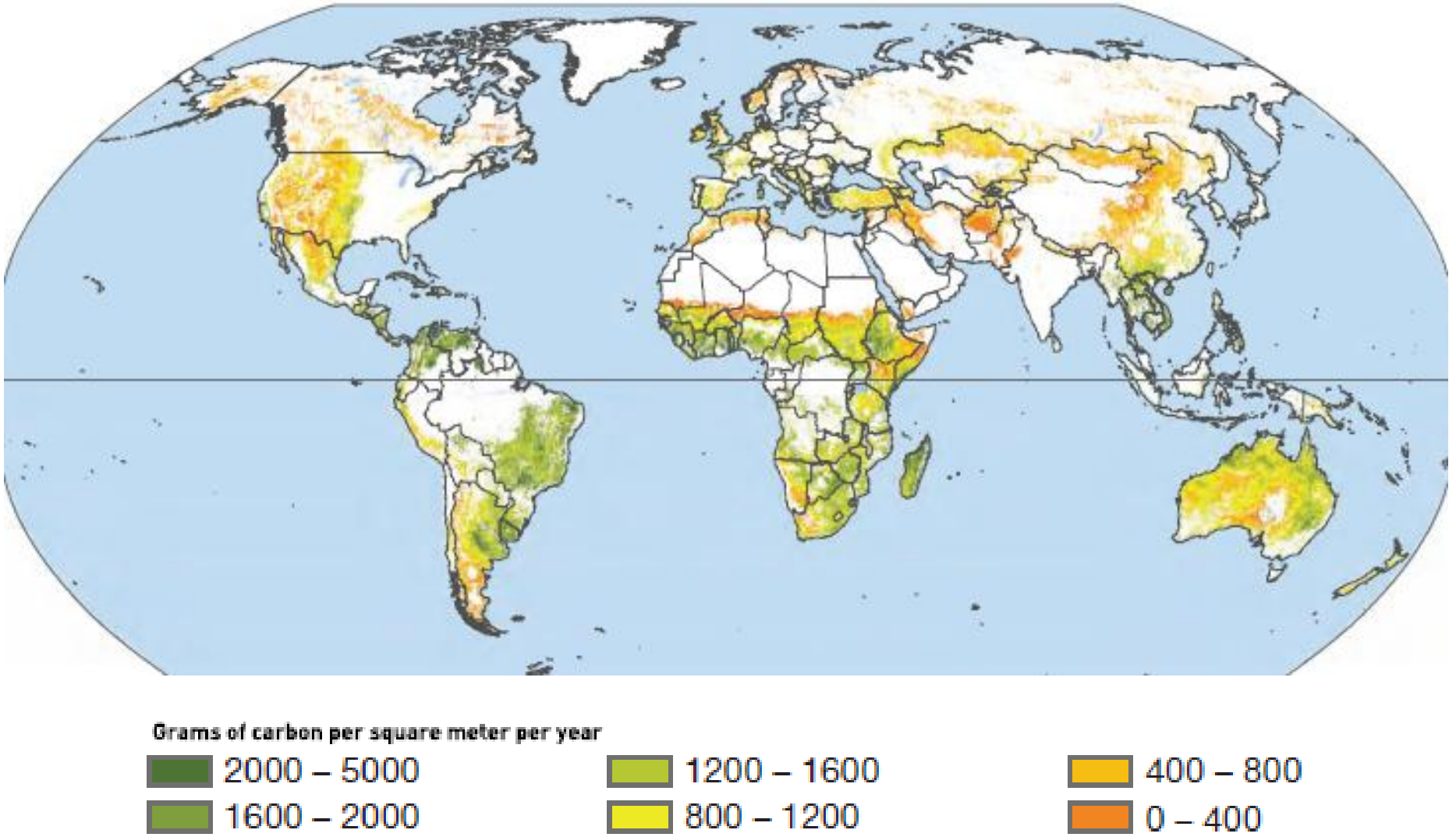
Estimated nonconcentrate feed inputs	Ruminants	Nonruminants	Total	
Forage (arable)	90	—	90	4
Forage (nonarable)	813	—	813	38
By-products	75	75	150	7
Crop residues	350	—	350	17
Subtotal	1328	75	1403	
Total feed inputs	1460	657	2117	

FAO, 2006

20 kg/kg **3.8 kg/kg**

2. 10^9 tonnes fourrages et aliments; 8.8 kg F&A/ kg viande carcasse

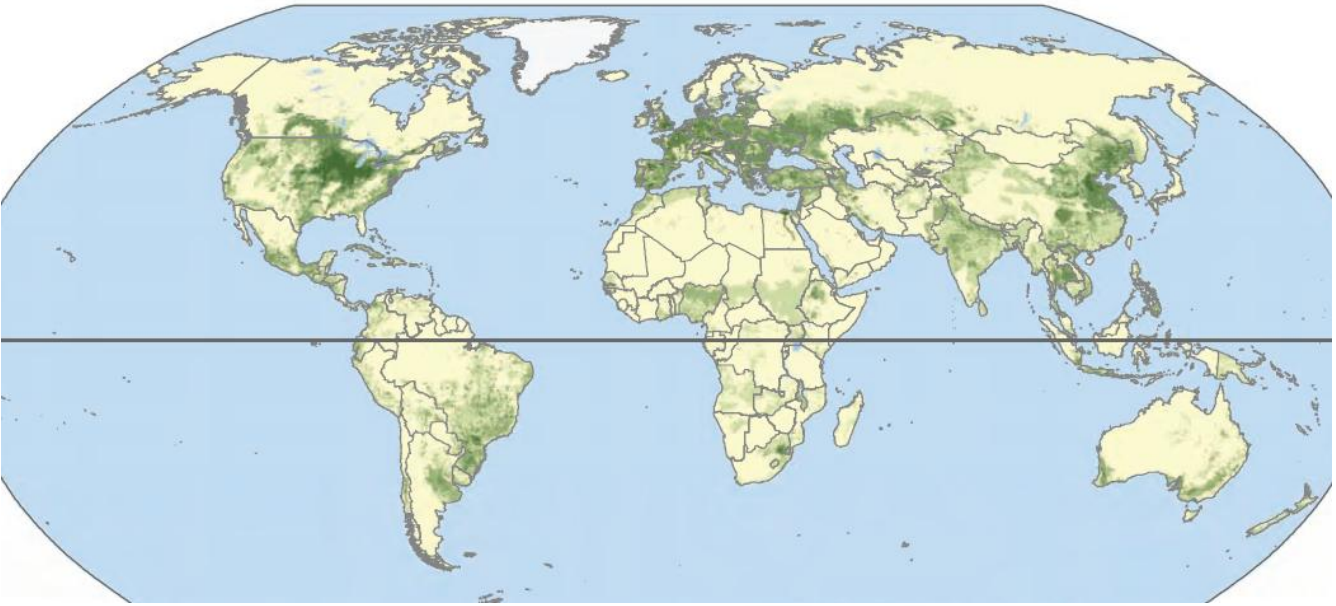
L’espace paturé, diversité des productivités primaire



FAO, 2006

Productions
Aliments / espace

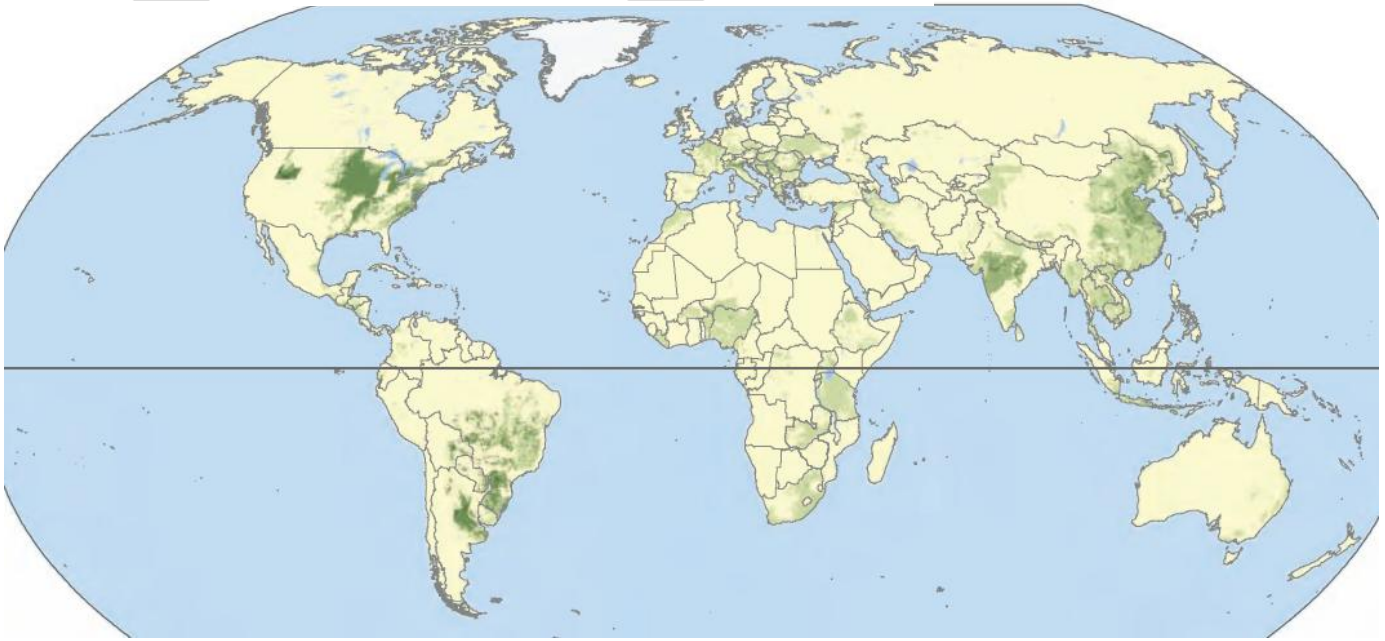
Céréales



Tonnes per square km

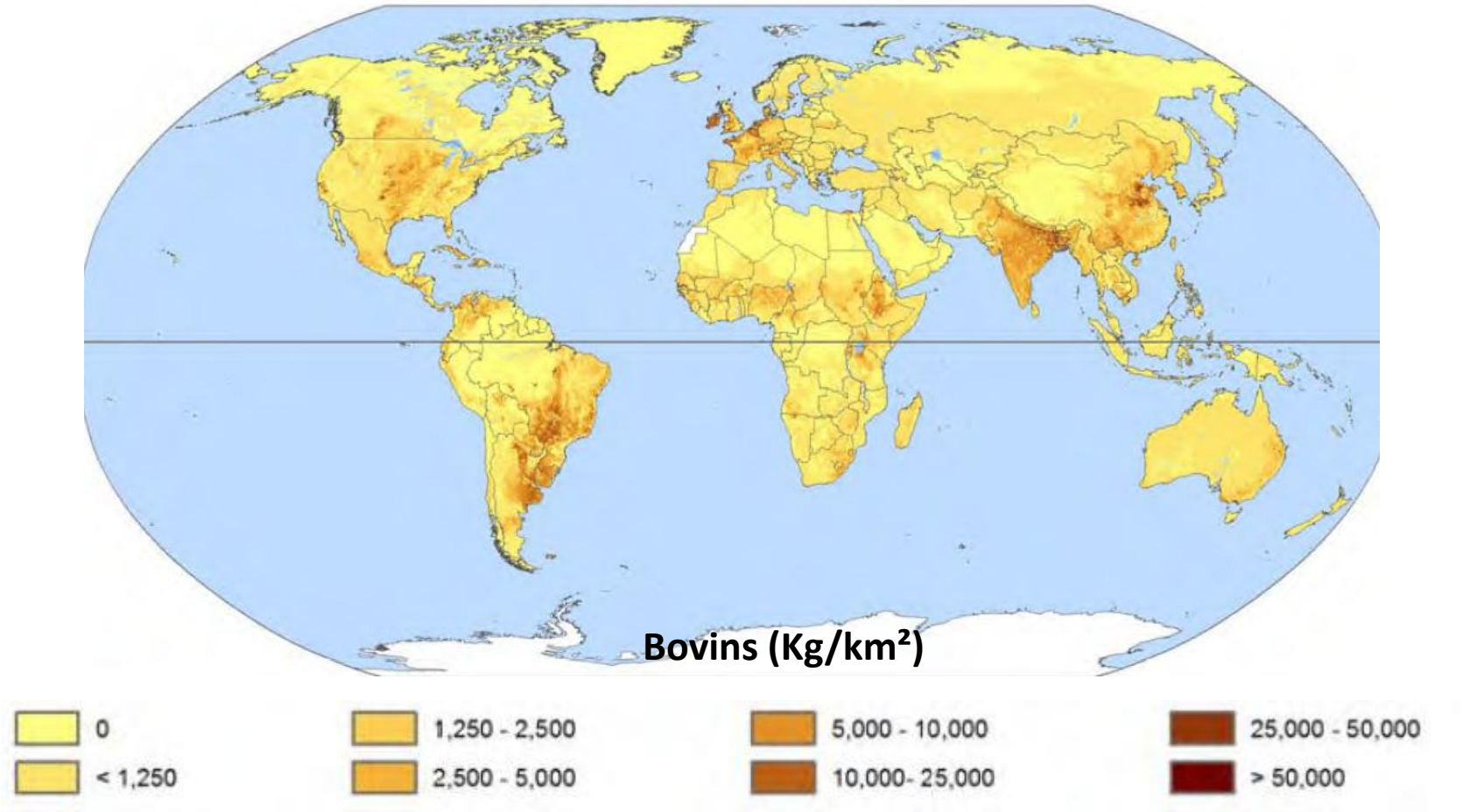
0	1 – 10	> 100
0 – 1	10 – 100	No data available

Soya



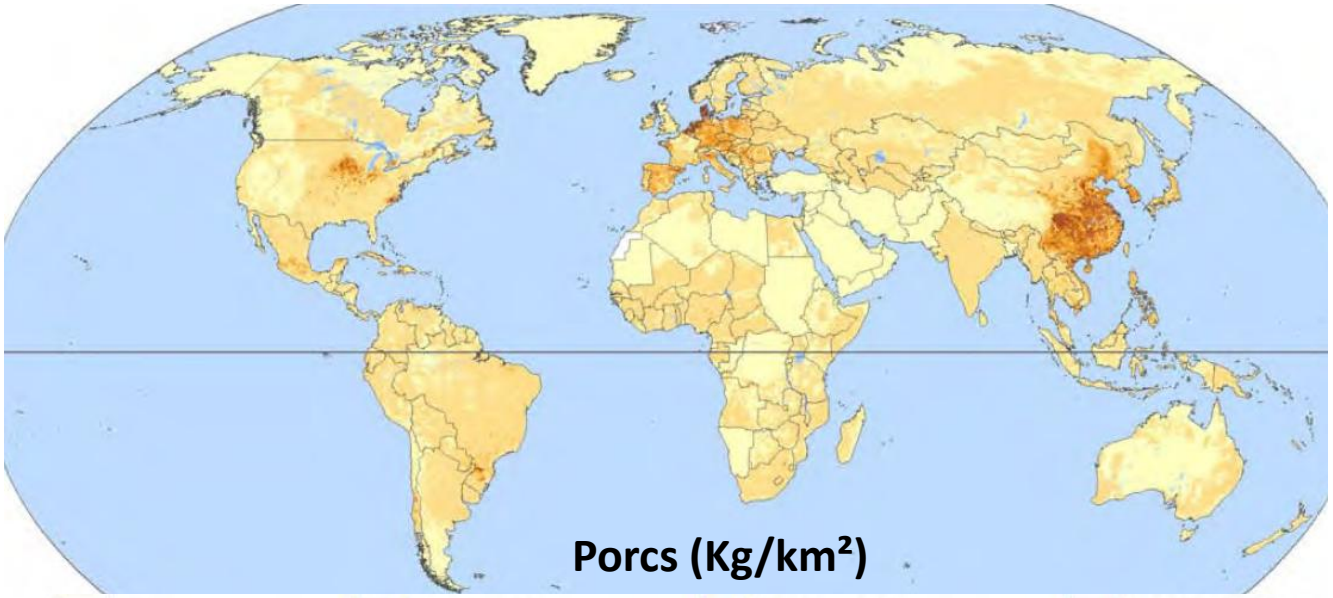
FAO, 2006

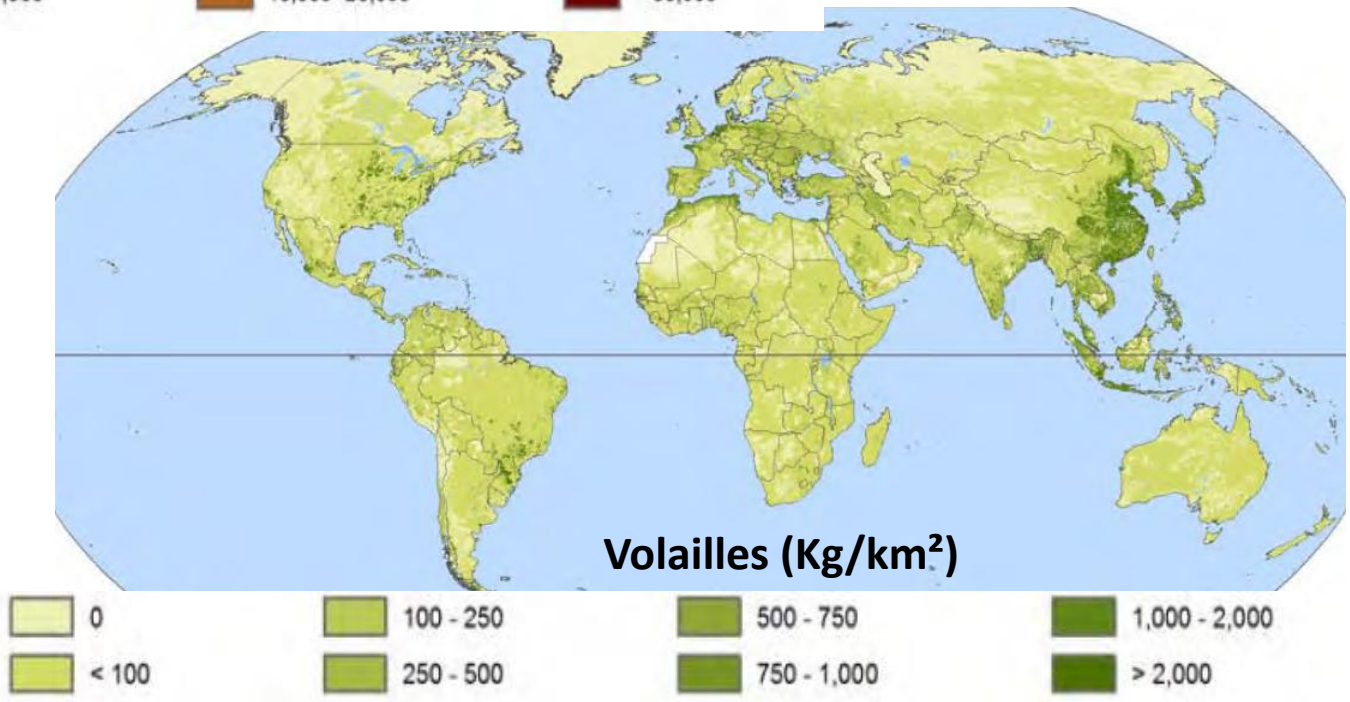
Densités animales



FAO, 2006

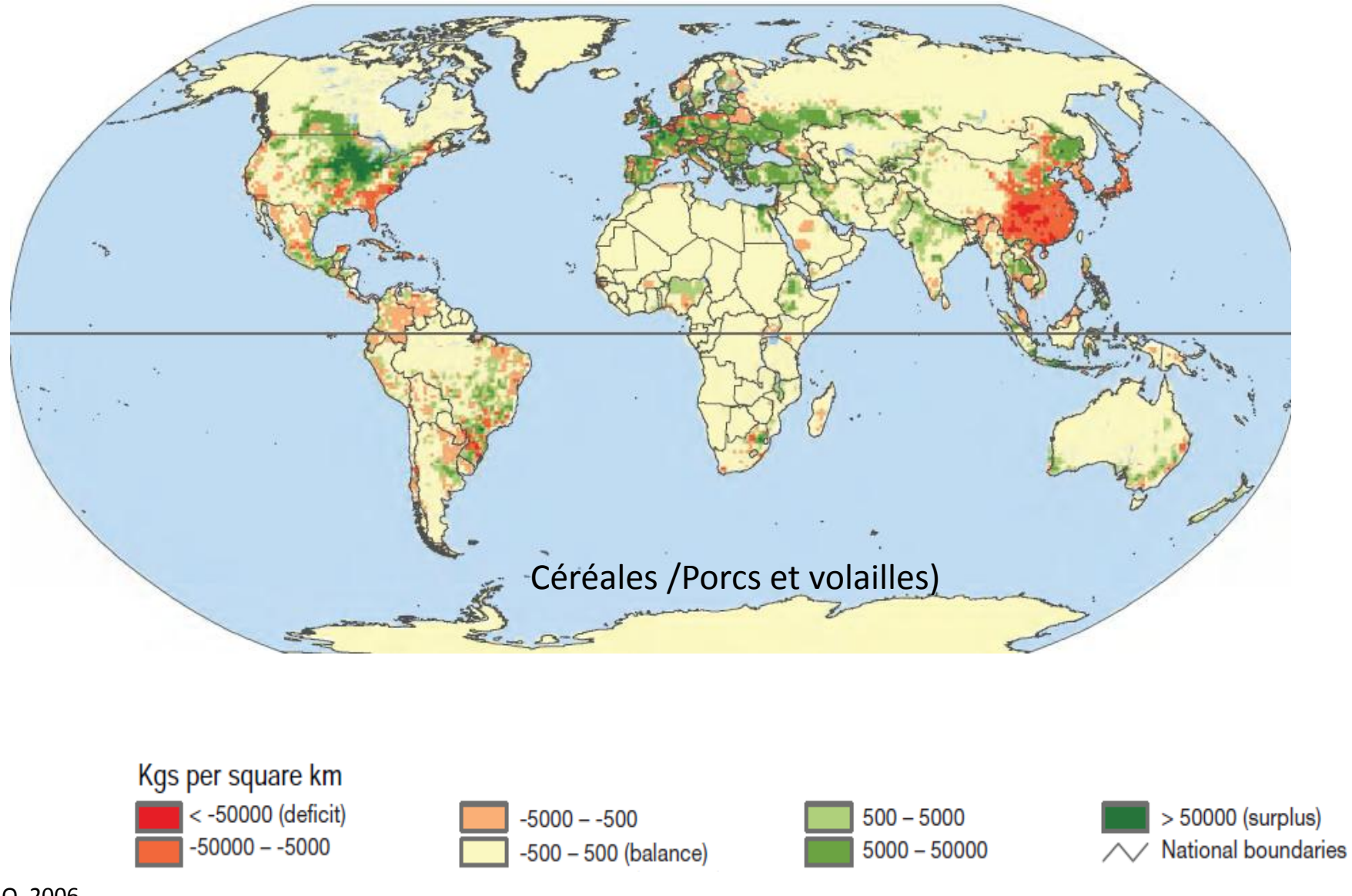
Densités animales





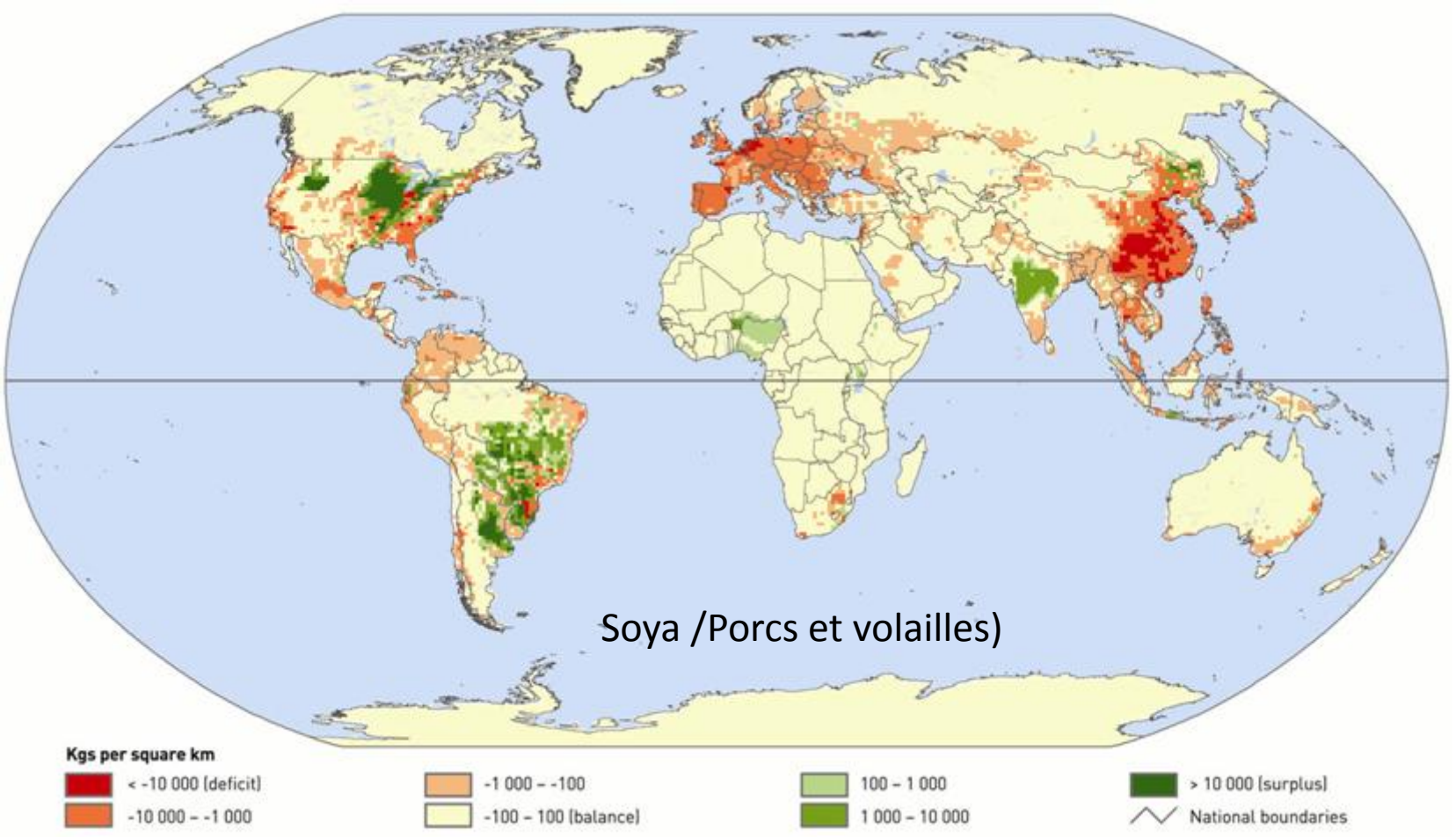
FAO, 2006

Surplus/déficits en ressources locales



FAO, 2006

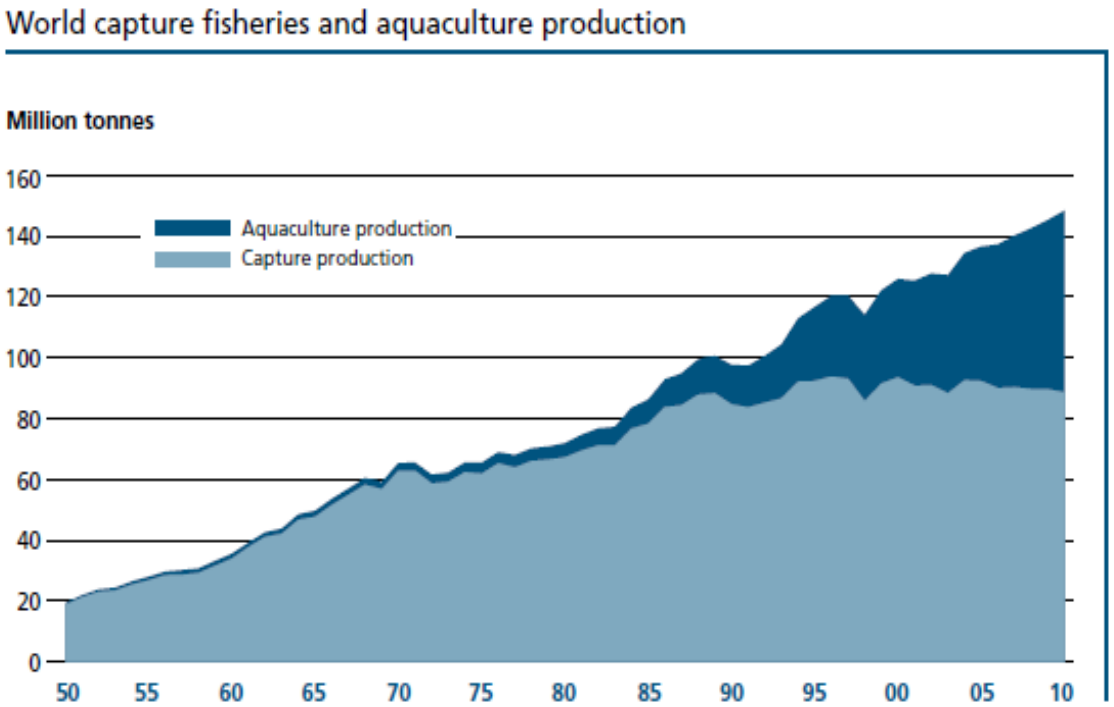
Surplus/déficits en ressources locales



FAO, 2006

Acteurs nouveaux

2008
708 10^6 t. industrial feeds
29.2 10^6 t. “aquafeeds” (4.1 %)



In order to keep pace with fed aquaculture production, global aquafeed production will continue to grow, and it is expected to reach 71.0 million tonnes by 2020. with important reduction of fish meal/oil proportion

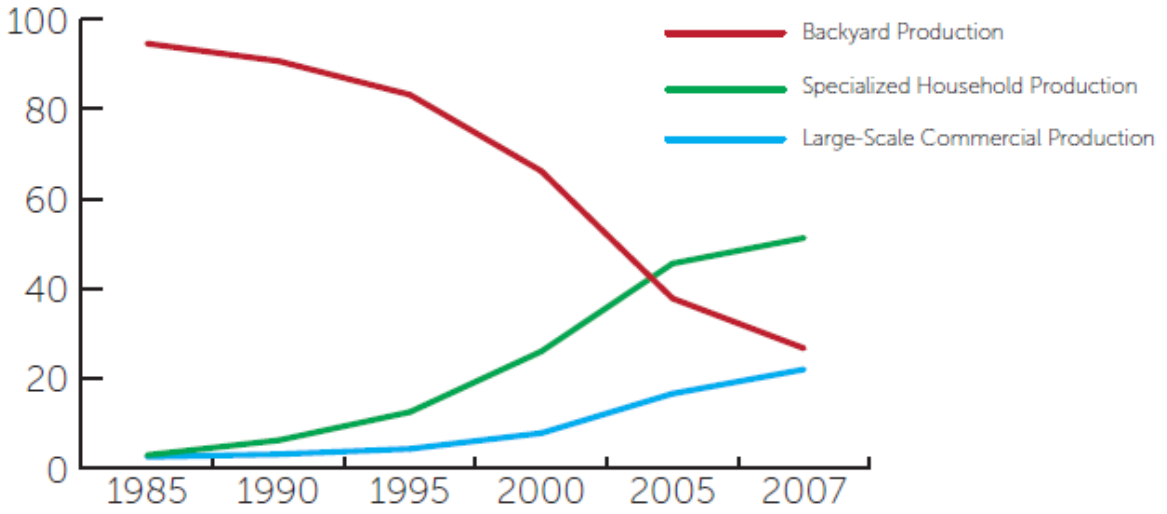
FAO. 2012. The State of World Fisheries and Aquaculture

Concentration intégration

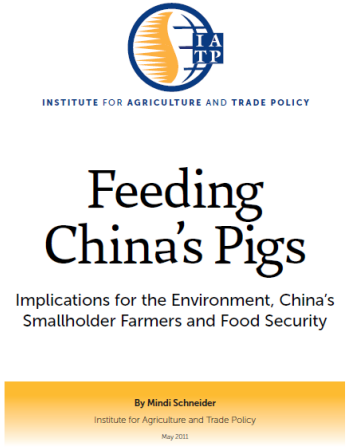
Chinas's strategic « Hog reserve »

China and World 2010 Pork Statistics at a Glance

	China	World	
Pork Production (ktons)	50,000	101,507	49%
Pork Consumption (ktons)	50,050	101,126	49%
Pork Imports (ktons)	350	5,645	6%
Pork Exports (ktons)	250	6,052	4%
Swine Production (10^3heads)	660,000	1,202,550	55%



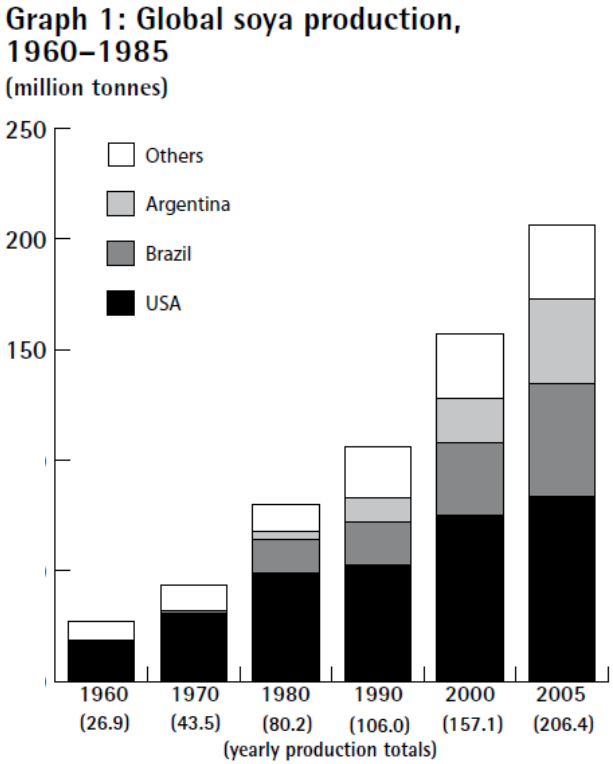
Source: Informa Economics and National Grain and Oil Information Center, 2009

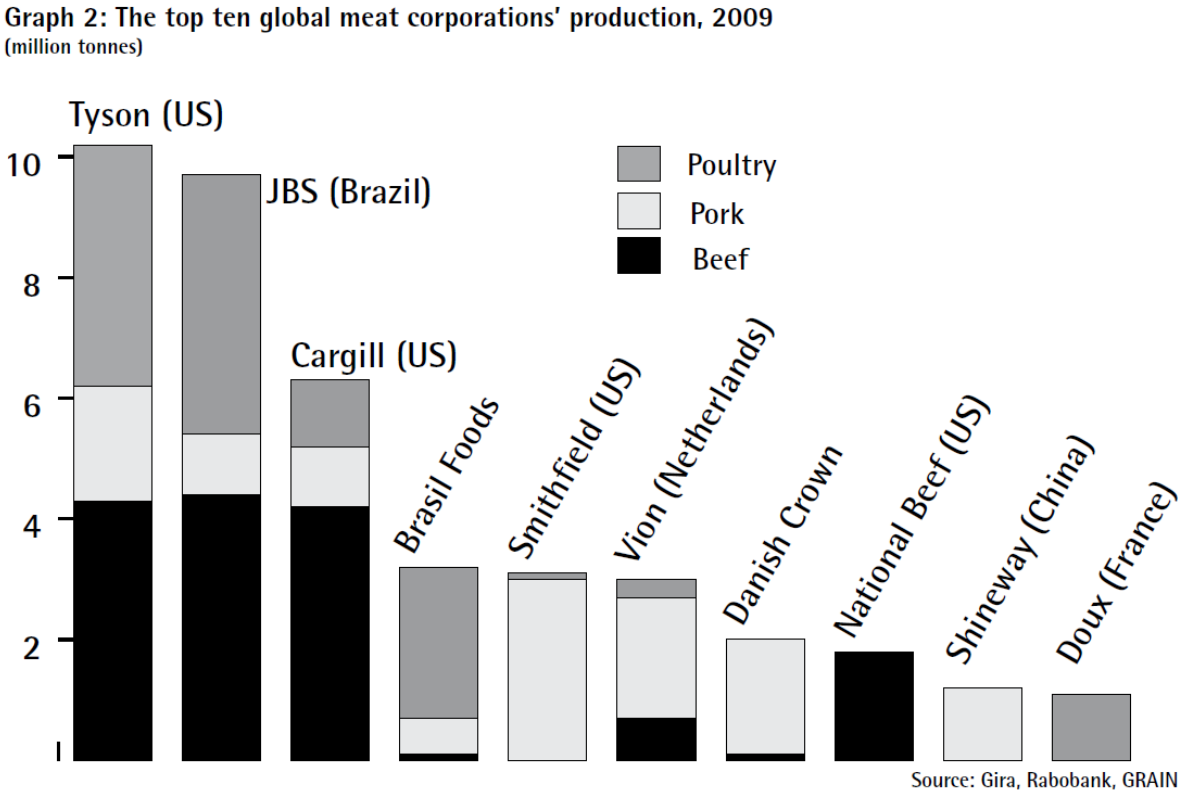


M. Schneider 2011, Institute for Agriculture and Trade Policy

Intégration « financiarisation »

Big Meat is growing in the South





GRAIN, Seedling, October 2010

Efficience de la production de protéines

Country 2005/07	Human edible protein input	Human edible protein output	Output-input ratio
	Million metric tonnes		
China	13.2	12.6	0.96
Brazil	3.3	3.1	0.92
India	1.0	4.4	4.30
Ethiopia	0.01	0.2	16.95
Kenya	0.01	0.2	21.16
New Zealand	0.1	0.7	10.07
USA	16.2	8.5	0.53
Netherlands	0.8	0.8	1.03

De grandes variations ….

Key feed sources in India: 2003 and 2020

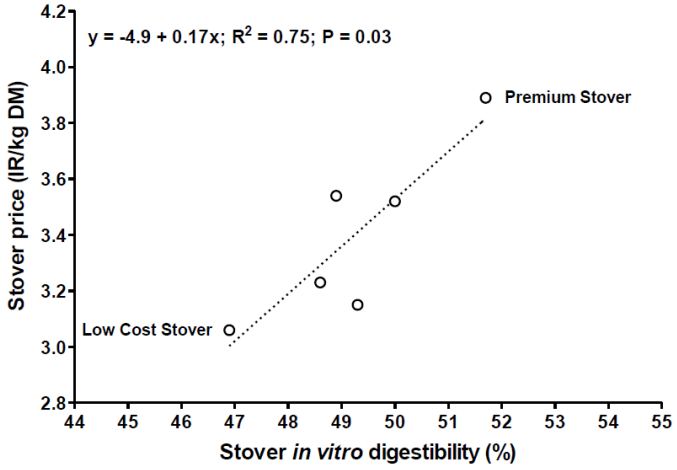
Feed Resource	%	
	2003	2020
Crop Residues	44.2	69.0
Planted fodder crops	34.1	n. diff
Greens (F/F/CPR/WL)	17.8	n. diff
Concentrates	3.9	7.3

(summarized from NIANP, 2005 and Ramachandra et al., 2007)

Ingredients	%
Sorghum stover	50
Bran/husks/hulls	18
Oilcakes	18
Molasses	8
Grains	4
Minerals, vitamins, urea	2

Courtesy: Miracle Fodder and Feeds PVT LTD

11

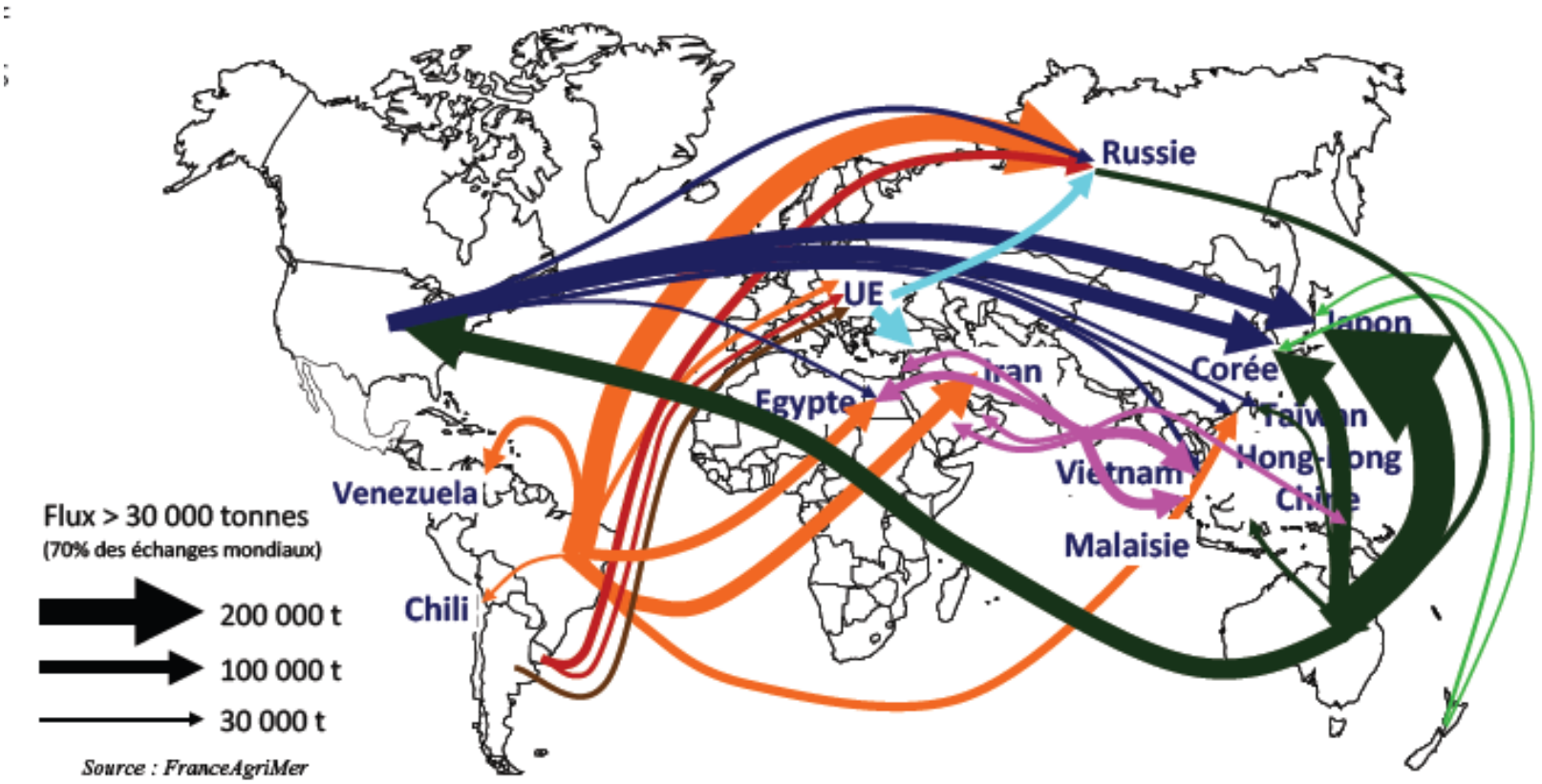


Blümmel and Parthasarathy, 2006

9

Fluxs internationaux de produits

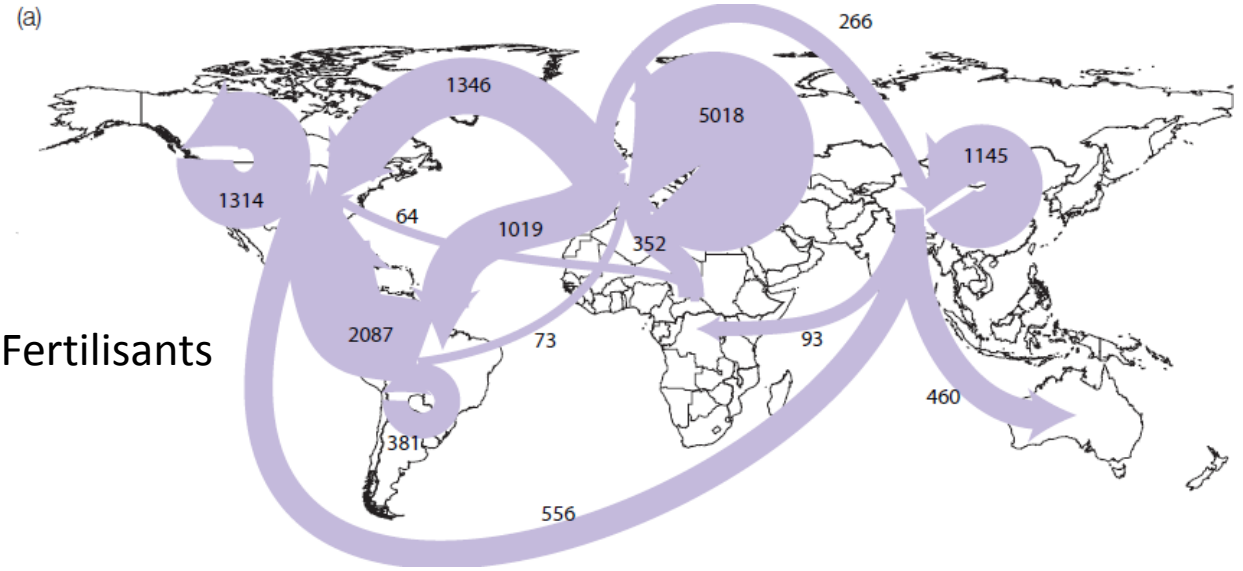
Ex. Viande rouge



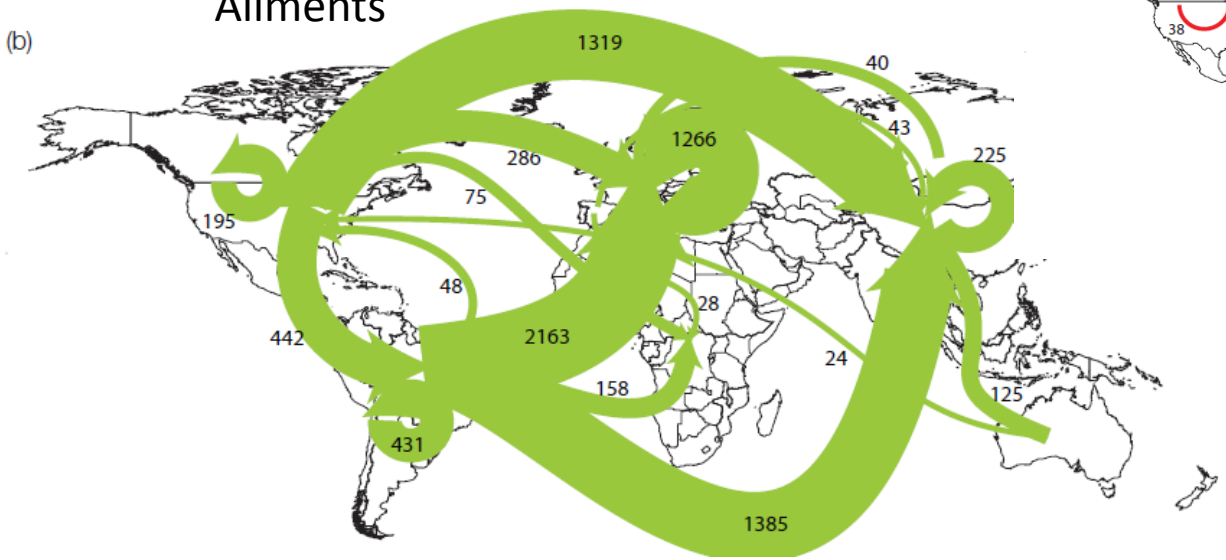
Fluxs internationaux et environnement

Ex. Azote

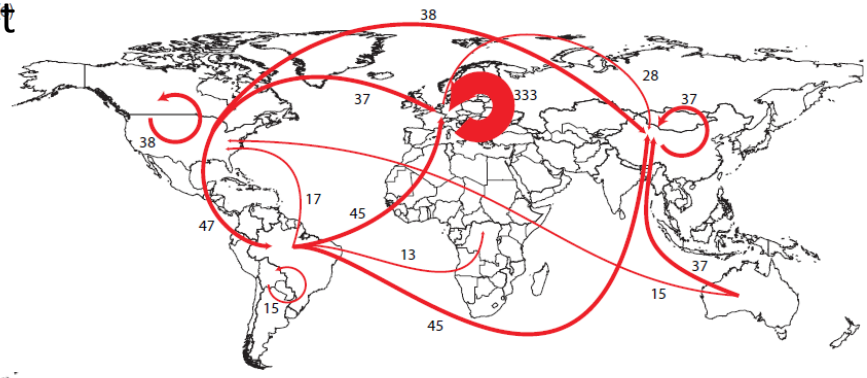
Fertilisants



Aliments



Meat



Conclusions